

same as *Anopheles lutzii* Theobald (not Cruz) = *A. cruzii* Dyar & Knab, is in error. *Kertessia* is described as possessing scales on the abdomen, which is not the case with *cruzii*. This correction will have to be made in the place referred to and in our later article (Ins. Ins. Mens., v, 38, 1917), by substituting for the name *boliviensis* that of *cruzii*. *Kertessia*, therefore, is still unknown to us in nature; but it evidently cannot be used as a subgeneric name for the bromelicolus species, and for these a new term will be required. We suggest *Dendropaeidium*. This group is defined as having the thorax and abdomen hairy, without scales, the head with upright scales only. The thorax is elongated as in *Anopheles* proper and *Myzomyia*, from which it differs in having the hairs of the mesonotum not diffused over the surface, but gathered together in narrow depressed stripes, separated by broad straight bare spaces. The wing-scales are lanceolate as in *Anopheles*.

## NOTES ON AMERICAN ANOPHELES

(*Diptera, Culicidae*)

BY HARRISON G. DYAR

An attempt is here made to recognize the Anopheline genera proposed by Theobald in a subgeneric sense, using the scale characters to form groups within the genus. The latest works on the subject<sup>1</sup> have abandoned these groups, and, as Stanton remarks<sup>2</sup> "The natural affinities of species have been obscured by the division of the group into a multiplicity of genera." Still, I think this is in part due to the somewhat unerical manner in which the scale-characters have been used. They are not of generic importance, clearly; but used as subgenera<sup>3</sup> they may be an assistance in classification. As used in the following, it appears that allied species are grouped together, proper

<sup>1</sup> Edwards, Bull. Ent. Research, iii, 241, 1912; Stanton, Bull. Ent. Research, vi, 159, 1915; Christophers, Ind. Jour. Med. Research, iii, 454, 1916; Howard, Dyar & Knab, Mosq. N. & Cent. Am. & W. I., iv, 962, 1917.

<sup>2</sup> Stanton, Bull. Ent. Research, iv, 129, 1913.

<sup>3</sup> Edwards at first (Bull. Ent. Research, ii, 141, 1911) used the names in the sense here proposed, but later abandoned the practice.

allowance being made for variation in the scale-characters. Used subgenerically, undue emphasis need not be laid upon them.

The subgenera occurring in America tabulate as follows:

Thorax and abdomen hairy, no scales.

Head with upright scales only.

Wing-scales lanceolate.

Thorax short, not over twice as long as wide,

*Coelodiazesis* Dyar & Knab

Thorax more elongate.

Hairs of mesonotum diffused.....*Anopheles* Meigen

Hairs in lines between broad bare spaces,

*Dendropaecidium* Dyar & Knab

Wing-scales in part large and inflated,

*Cyclolepteron* Theobald

Head with flat scales in the median area.....*Stethomyia* Theobald

Thorax hairy or with a few scales on the margin; abdomen with scales.

Abdomen hairy dorsally with lateral scale-tufts,

*Arribalzagia* Theobald

Abdomen with large irregular black scales; no tufts,

*Kerteszia* Theobald

Thorax with distinct narrow curved scales.

Abdomen hairy, or with scales only on the anal segment.

Antennæ hairy .....*Myzorhynchella* Theobald

Antennæ with scales at the whorls.....*Chagasia* Cruz

Abdomen hairy, the last three segments scaled; no tufts,

*Manguinhosia* Cruz

Abdomen scaled in part or throughout and with lateral tufts,

*Cellia* Theobald

### Genus ANOPHELES Meigen

Subgenus COELODIAZESIS Dyar & Knab

*Coelodiazesis* Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 177,  
1906.

*Cyclophorus* Eysell, Arch. Schiffs-u. Trop.-Hyg., xvi, 421, 1912.

**Anopheles (Coelodiazesis) barberi** Coquillett.

*Anopheles barberi* Coquillett, Can. Ent., xxxv, 310, 1903.

Eastern United States, the larvæ in tree-holes.

Subgenus ANOPHELES Meigen

*Anopheles* Meigen, Syst. Beschr. bek. eur. zweifl. Ins., i, 10, 1818.

## TABLE OF SPECIES

Tarsi wholly dark colored.

Hind tibiæ broadly white at apex.....*eiseni* Coquillett

Hind tibiæ without white apical ring.

Wings with a white spot at outer third of costa.

Palpi marked with white; third vein extensively white in  
the middle.....*pseudopunctipennis* Theobald

Palpi wholly black; third vein wholly black scaled,  
*punctipennis* Say

Wings without such spot on the costa.

Wings with patches of yellowish scales; sixth vein with  
three black spots.....*crucians* Wiedemann

Wings without patches of pale scales.

Wing at apex with a coppery spot on fringe,  
*occidentalis* Dyar & Knab

Wing-fringe uniformly dark throughout.

Body not wholly blackish; hairs of mesonotum yel-  
low or white.

Palpi of the female blackish scaled through-  
out; wing scales forming spots at the  
bases of the fork-cells,

*quadrimaculatus* Say

Palpi of the female with dull silvery white  
rings at bases of joints; scales of wings  
mesially not distinctly massed at bases  
of fork-cells.....*walkeri* Theobald

Body blackish throughout; hairs of mesonotum  
dark brown.....*atropos* Dyar & Knab

Tarsi speckled with white.

Hind tarsi with the last two joints largely black,

*vestitipennis* Dyar & Knab

Hind tarsi with the last two joints wholly white,

*annulipalpis* Lynch Arribálzaga

### Anopheles (Anopheles) *eiseni* Coquillett.

*Anopheles eiseni* Coquillett, Journ. N. Y. Ent. Soc., x, 192, 1902.

*Myzomyia tibiamaculata* Neiva, Brazil-Medico, xx, 288, 1906.

Tropical America, the larvæ in tree-holes and pools in rocks.

### Anopheles (Anopheles) *pseudopunctipennis* Theobald.

*Anopheles pseudopunctipennis* Theobald, Mon. Culic., ii, 305, 1901.

*Anopheles franciscanus* McCracken, Ent. News, xv, 12, 1904.

*Anopheles peruvianus* Tamayo, Mem. de la Municipalidad de  
Lima, 1906, xxxv, 1907.

*Proterorhynchus argentinus* Brèthes, Bol. Inst. Ent. y Pat. Veg., i, 15, 1912.

*Anopheles tucumanus* Lahille, An. Mus. Nac. Buen. Aires, xxiii, 253, 1912.

Tropical America and the adjacent warmer temperate regions, the larvæ in permanent ground pools.

#### *Anopheles (Anopheles) punctipennis* Say.

*Culex punctipennis* Say, Journ. Acad. Nat. Sci. Phil., iii, 9, 1823.

*Culex hyemalis* Fitch, Amer. Jn. Agr. & Sci., v, 281, 1847.

*Anopheles perplexens* Ludlow, Can. Ent., xxxix, 267, 1907.

Southern Canada, United States to central Mexico, the larvæ in ground pools, both permanent and temporary.

#### *Anopheles (Anopheles) crucians* Wiedemann.

*Anopheles crucians* Wiedemann, Ausser. zweifl. Ins., i, 12, 1828.

Southeastern United States and Greater Antilles, the larvæ in ground pools, especially near the coast.

#### *Anopheles (Anopheles) quadrimaculatus* Say.

*Anopheles quadrimaculatus* Say, Keating's Narr. Exp. Peter's Riv., ii, 356, 1824.

*Anopheles guttulatus* Harris, Hitch. Rept. Geol. Zool. Mass., 595, 1835.

*Anopheles annulimanus* van der Wulp, Tids. voor Ent., x, 129, 1867.

North America, east of the Rocky Mountains, the larvæ in permanent swamps, especially connected with rivers. The name *quadrimaculatus* apparently should be applied to the next species, but I have ignored that in order to avoid confusion that would result from the change.

#### *Anopheles (Anopheles) occidentalis* Dyar & Knab.

*Anopheles occidentalis* Dyar & Knab, Proc. Biol. Soc. Wash., xix, 159, 1906.

North America west of the Rocky Mountains and eastward through Canada to Maine, the larvæ in ground pools of permanent character.

**Anopheles (Anopheles) atropos Dyar & Knab.**

*Anopheles atropos* Dyar & Knab, Proc. Biol. Soc. Wash., xix, 160, 1906.

Florida Keys and Gulf Coast, the larva unknown.

**Anopheles (Anopheles) walkeri Theobald.**

*Anopheles walkeri* Theobald, Mon. Culic., i, 299, 1901.

Eastern North America, the larvæ in fluctuating swamps along rivers, filled by flood-water.

**Anopheles (Anopheles) vestitipennis Dyar & Knab.**

*Anopheles vestitipennis* Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Mexico, Central America and Greater Antilles, the larva unknown.

**Anopheles (Anopheles) annulipalpis Lynch Arribálzaga.**

*Anopheles annulipalpis* Arribálzaga, Nat. Arg., i, 149, 1878.

*Anopheles annulipes* Theobald (not Walker), Mon. Culic., v, 84, 1910.

Argentina, the larva unknown.

## Subgenus DENDROPAEDEUM Dyar &amp; Knab

*Dendropaedium* Dyar & Knab, Ins. Ins. Mens., vi, 141, 1918.

## TABLE OF SPECIES

Wing with four white spots involving costa and first vein.

Third vein broadly white in the middle.

Hind tarsi with the last four joints black, apically ringed with white, the fifth wholly black.....*bellator* Dyar & Knab

Hind tarsi with these joints white with black rings at their bases .....*cruzii* Dyar & Knab

Third vein black, a minute white spot at base,

.....*hylephilus* Dyar & Knab

Wing with only the outer two spots involving the costa,

.....*neivai* Howard, Dyar & Knab

**Anopheles (Dendropaedium) bellator Dyar & Knab.**

*Anopheles bellator* Dyar & Knab, Proc. Biol. Soc. Wash., xix, 160, 1906.

Island of Trinidad, the larvæ in Bromeliaceæ.

**Anopheles (Dendropaedium) cruzii Dyar & Knab.***Anopheles lutzii* Theobald (not Cruz), Mon. Culic., i, 177, 1901.*Anopheles cruzii* Dyar & Knab, Proc. U. S. N. M., xxxv, 53, 1908.

Brazil, the larvæ in Bromeliaceæ.

**Anopheles (Dendropaedium) hylephilus Dyar & Knab.***Anopheles hylephilus* Dyar & Knab, Ins. Ins. Mens., v, 38, 1917.

Venezuela, Ecuador and Panama, the larva unknown.

**Anopheles (Dendropaedium) neivai Howard, Dyar & Knab.***Anopheles neivai* Howard, Dyar & Knab, Mosq. N. & Cent. Am. & W. I., iv, 986, 1917.

Panama and southern Mexico, the larvæ in Bromeliaceæ.

## Subgenus CYCLOLEPPTERON Theobald

*Cycloleppterion* Theobald, Mon. Culic., i, 205, 1901.**Anopheles (Cycloleppterion) grabhamii Theobald.***Anopheles grabhamii* Theobald, Mon. Culic., i, 205, 1901.

Greater Antilles, the larvæ in ground pools.

## Subgenus STETHOMYIA Theobald

*Stethomyia* Theobald, Journ. Trop. Med., v, 181, 1902.**Anopheles (Stethomyia) nimba Theobald.***Stethomyia nimba* Theobald, Mon. Culic., iii, 62, 1903.

British Guiana and Brazil, the larva unknown.

## Subgenus ARRIBALZAGIA Theobald

*Arribalzagia* Theobald, Mon. Culic., iii, 81, 1903.

## TABLE OF SPECIES

Wing-scales considerably inflated, black ones on the base of the fourth vein being noticeable.

Third vein spotted; fourth and fifth hind tarsals white at base and tip ..... *intermedium* Chagas

Third vein with a black spot at base, the rest mixed; fourth hind tarsal with a white middle band beside the white apices, the fifth commonly all white.

White on hind tarsi less extensive, appearing black with white rings; fifth joint sometimes with a small black band,

*punctimacula* Dyar & Knab

White on hind tarsi extensive, appearing white with black dots ..... *mediopunctatus* Theobald

Wing-scales narrower, broadly elliptical to lanceolate.

Third vein mixed; fourth tarsal with white tip, the fifth all black,  
*maculipes* Theobald

Third vein spotted; fourth and fifth tarsi white at base and tip.

Tarsi white at base and tip only.

Third vein white-scaled, a black spot at base and before  
tip; tip white ..... *pseudomaculipes* Chagas

Third vein with five white spots, or four when the middle  
one is absent, the tip black,

*apicimacula* Dyar & Knab

Fourth hind tarsal with a middle white ring beside the tips,  
fifth all white ..... *strigimacula* Dyar & Knab

### Anopheles (Arribalzagia) intermedium Chagas.

*Cyclolepteron intermedium* Chagas, in Peryassú, Os Culic. do  
Brazil, 85, 1908.

Brazil, the larva unknown.

### Anopheles (Arribalzagia) punctimacula Dyar & Knab.

*Anopheles punctimacula* Dyar & Knab, Proc. Biol. Soc. Wash.,  
xix, 136, 1906.

*Anopheles malefactor* Dyar & Knab, Journ. N. Y. Ent. Soc., xv,  
198, 1907.

Panama, the larvæ in ground pools. In the monograph, Mr. Knab, at the last moment, placed *punctimacula* with *apicimacula* on his own responsibility. I agree with him in the reduction by one of the number of species, but I think that the single type of *punctimacula* is clearly a *malefactor* and not an *apicimacula*.

### Anopheles (Arribalzagia) mediopunctatus Theobald.

*Cyclolepteron mediopunctatus* Theobald, Mon. Culic., iii, 83,  
1903.

Trinidad and Brazil, the larvæ unknown.

### Anopheles (Arribalzagia) maculipes Theobald.

*Arribalzagia maculipes* Theobald, Mon. Culic., iii, 81, 1903.

Brazil, the larvæ in ground pools. The specimen from Trinidad recorded in the Monograph (page 992, Chaqueñas, Trinidad, March, 1914, I. F. Lasalle) is not *maculipes*, but the variety of *apicimacula* without the central black spot on the third vein of the wing.

**Anopheles (Arribalzagia) pseudomaculipes Chagas.**

*Arribalzagia pseudomaculipes* Chagas, in Peryassú, Os Culic. do Brazil, 108, 1908.

Brazil, the larva unknown.

**Anopheles (Arribalzagia) apicimacula Dyar & Knab.**

*Anopheles apicimacula* Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Mexico, Central America and Trinidad, presumably also the northern coast of South America, the larvæ in pools in stream-beds.

**Anopheles (Arribalzagia) strigimacula Dyar & Knab.**

*Anopheles strigimacula* Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Tropical Mexico, the larvæ in pools in stream-beds.

Subgenus KERTESZIA Theobald

*Kerteszia* Theobald, Ann. Nat. Mus. Hung., iii, 66, 1905.

**Anopheles (Kerteszia) boliviensis Theobald.**

*Kerteszia boliviensis* Theobald, Ann. Nat. Mus. Hung., iii, 66, 1905.

Bolivia, the larvæ unknown. The identification of this species with *A. (Dendropaeclium) crusii* D. & K. made by Mr. Knab has been corrected on a previous page.

Subgenus MYZORHYNCHELLA Theobald

*Myzorhynchella* Theobald, Mon. Culic., iv, 78, 1907.

TABLE OF SPECIES (FROM PERYASSU)

- Extremidade do pé (=*os 4 ultimos articulos tarsaes*) posterior completamente branca. Mesonoto unicolor, com 3 estrias escuras; azas com as costas distintamente manchadas de amarello. Abdomen piloso, excepto o segmento genital que possue escamas,

*lutzii* Cruz

2. Idem, mas com as manchas da costa brancas e escamas brancas no segmento genital. Especie menor que a *lutzii*.....*parva* Chagas
3. Idem, mas junto ás extremidades basaes dos 2os e 3os articulos posteriores ha um anel preto.....*nigritarsis* Chagas
5. Pernas posteriores com as extremidades apical da tibia e basal do metatarso brancas em grande extensão.....*gilesi* Neiva

**Anopheles (Myzorhynchella) lutzii Cruz.**

*Anopheles lutzii* Cruz, Brazil-Medico, xv, 423, 1901.

*Myzorhynchella nigra* Theobald, Mon. Culic., v, 78, 1907.

Brazil, the larvæ unknown. The species is not before me.

**Anopheles (Myzorhynchella) parva Chagas.**

*Myzorhynchella parva* Chagas, Nov. Esp. de Cul. Braz., 4, 1907.

Brazil, the larva unknown.

**Anopheles (Myzorhynchella) nigritarsis Chagas.**

*Myzorhynchella nigritarsis* Chagas, in Peryassú, Os Culic. do Brazil, 97, 1908.

Brazil, the larvæ unknown. The species is not before me.

**Anopheles (Myzorhynchella) gilesi Neiva.**

*Myzorhynchella gilesi* Neiva, in Peryassú, Os Culic. do Brazil, 103, 1908.

Brazil, the larvæ unknown. The species is not before me.

Subgenus CHAGASIA Cruz

*Chagasia* Cruz, Brazil-Medico, xx, 199, 1906.

**Anopheles (Chagasia) farjardi Lutz.**

*Pyretophorus farjardi* Lutz, in Bourroul, Mosq. do Brasil, 16, 1904.

*Chagasia nivae* Cruz, Brazil-Medico, xx, 199, 1906.

Brazil, the larvæ unknown.

Subgenus MANGUINHOSIA Cruz

*Manguinhosia* Cruz, Um Nov. Gen. Braz. da s.-f. "Anophelinæ," 1907.

**Anopheles (Manguinhosia) peryassui Dyar & Knab.**

*Manguinhosia lutzi* Cruz (not *Anopheles lutzii* Cruz), Um Nov.

Gen. Braz. da s.-f. "Anophelinæ," 1907.

*Anopheles peryassui* Dyar & Knab, Proc. U. S. N. M., xxxv, 53,  
note, 1908.

Brazil, the larvæ unknown.

Subgenus **CELLIA** Theobald

*Cellia* Theobald, Journ. Trop. Med., v, 183, 1902.

## TABLE OF SPECIES

Hind tarsi all white beyond the second joint.

Scales on the dorsum of all the abdominal segments.

Lower fork of the second vein with a white patch at the tip,  
*argyritarsis* Robineau-Desvoidy

Lower fork of second vein with a black patch at the tip,  
*pictipennis* Philippi

Scales on the last two abdominal segments only,

*braziliensis* Chagas

Hind tarsi similar but with a black spot on the last joint.

Palpi with the last two joints white except narrowly at bases,  
*tarsimaculata* Goeldi

Palpi with the last joint only white.....*albitarsis* Wiedemann

**Anopheles (Cellia) argyritarsis** Robineau-Desvoidy.

*Anopheles argyritarsis* Robineau-Desvoidy, Mém. Soc. d'Hist. Nat., iii, 411, 1827.

Tropical American mainland, Lesser Antilles, the larvæ in ground pools and artificial receptacles. The abdominal scale-tufts, which condition the subgeneric reference, are occasionally wanting in this species.

**Anopheles (Cellia) pictipennis** Philippi.

*Culex pictipennis* Philippi, Verh. z.-b. Ges. Wien, xv, 596, 1865.

*Anopheles albitarsis* Lynch Arribálzaga, El Nat. Arg., i, 151, 1878.

*Anopheles bigotii* Theobald, Mon. Culic., i, 135, 1901.

Chile and Argentina, the larva unknown. This is not before me.

**Anopheles (Cellia) braziliensis** Chagas.

*Cellia braziliensis* Chagas, Nov. Esp. de Cul. Braz., 18, 1907.

Brazil, the larvæ unknown.

**Anopheles (Cellia) tarsimaculata** Goeldi.<sup>1</sup>

*Anopheles tarsimaculata* Goeldi, Os Mosq. no Pará, 133, 1905.

*Anopheles gorgasi* Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 198, 1907.

Tropical American mainland, Lesser Antilles, the larvae in ground pools of any kind except artificial.

**Anopheles (Cellia) albimanus** Wiedemann.<sup>1</sup>

*Anopheles albimanus* Wiedemann, Dipt. Exot., 10, 1821.

*Anopheles cubensis* Agramonte, El Progreso Medico, x, 460, 1900.

*Anopheles argyrotarsis albipes* Theobald, Mon. Culic., i, 125, 1901.

*Anopheles dubius* Blanchard, Les Moust., 205, 1905.

Tropical America, including the Greater Antilles and southern Florida, the larvae in ground pools, often of brackish water.

## NEW MUSCOID GENERA, SPECIES AND SYNONYMY

*(Diptera)*

By CHARLES H. T. TOWNSEND

In the revision of muscoid groups and genera, based mostly on material in the National Museum collection, it becomes necessary to characterize the following new genera and species:

### Pseudogymnosoma, new genus.

Genotype, *Pseudogymnosoma inflatum*, new species.

No hypopleurals. Abdomen inflated and globose, like *Rhodogyne*, nearly bare. Head much like *Stomorhina*, but epistoma short and not widened nor sprung convexly, the face being dished. No facial carina. Arista plumose. Palpi widened and flattened. Upper facets of male eyes greatly enlarged. Male hypopygium small.

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<sup>1</sup> Compare an article by James Zetek on the relationship of these two forms (Ann. Ent. Soc. Am., viii, 221-271, 1915). The same intergradation in palpal coloration has recently been observed in specimens from Guayaquil, Ecuador (F. Campos R.).